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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,455	07/10/2003	Yingyong Qi	030255	3240

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Patents Department
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EXAMINER

LUU, MATTHEW

ART UNIT PAPER NUMBER

2676

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/617,455

Applicant(s)

QI ET AL.

Examiner

LUU MATTHEW

Art Unit

2676

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7, 9-20, 22-24 and 26-29 is/are rejected.
- 7) ☒ Claim(s) 4, 8, 21 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/2/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5-7, 9-12, 14-15, 18-20, 22-24 and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Regan (6,407,736) in view of Deering (US 2003/0122815).

Regarding claims 1 and 18, Regan discloses (Figs. 1-5 and 10-15) an apparatus comprising a rendering engine (the graphics system shown in Fig. 1) that defines a rectangular area of pixels (Figs. 34A-34C, the bounding boxes) that bounds a triangular area of the pixels (the triangles) (Figs. 13-14, column 33, lines 43-56) (See also column 6, lines 44-61; and column 24, lines 53-57).

Regan fails to explicitly teach evaluating coordinates associated with the pixels of the rectangular area to selectively render the pixels that fall within the triangular area.

However, Deering discloses (Figs. 13B-13E) the determination of a triangle-bounding box, which fits efficiently around the given triangle (Fig. 13B, step 216) and computing linear equation parameters for each edge of the triangle (step 217C).

Deering further teaches evaluating coordinates associated with the pixels of the

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rectangular area to selectively render the pixels that fall within the triangular area (See sections 161 and 162).

It would have been obvious to a person of ordinary skill in the art at the time of the invention to use the minimal bin bounding box, as shown in Fig. 13E of Deering, for the triangle bounding box of Regan to provide an accurate and more effective rendering engine that renders the triangles.

Regarding claims 2 and 19, Regan further discloses a set of linear equations (equations (1) and (6) – (8)) that uses the vertices of the triangle (x_0, y_0, z_0) , (x_1, y_1, z_1) and (x_2, y_2, z_2) (Column 29, lines 8-36).

Deering also discloses (Fig. 13B, step 217C) computing linear equation parameters for each edge of the triangle (step 217C).

Regarding claims 3 and 20, Regan further discloses a coefficient matrix $(a, b \text{ and } c)$ coefficients of the linear equation (1) $ax+by+c=z$ is used to determine whether each of the pixels falls within the triangle (Column 29, line 30 to column 30, line 4) (See also column 5, lines 8-11).

Deering also teaches evaluating coordinates associated with the pixels of the rectangular area to selectively render the pixels that fall within the triangular area (See sections 161 and 162).

Regarding claims 5 and 22, note the rejection as set forth above with respect to claim 3. Regan further teaches one or more attributes associated with the triangle (Column 22, lines 1-6). It is well known in the art that when one of the attributes such as color, shape, size, etc. being changed, the attribute data is being updated.

Regarding claims 6 and 23, note the rejection as set forth above with respect to claim 5.

Regarding claims 7 and 24, Regan further discloses a coefficient matrix (a, b and c coefficients of the linear equation (1) $ax+by+c=z$ is used to determine whether each of the pixels falls within the triangle (Column 29, line 30 to column 30, line 4) (See also column 5, lines 8-11).

Deering discloses (Figs. 13B-13E) the determination of a triangle-bounding box, which fits efficiently around the given triangle (Fig. 13B, step 216) and computing linear equation parameters for each edge of the triangle (step 217C). Deering further teaches evaluating coordinates associated with the pixels of the rectangular area to selectively render the pixels that fall within the triangular area (See sections 161 and 162).

Regarding claims 9 and 26-27, Regan further teaches the rendering engine (the graphics system shown in Fig. 1) compares a z-value of the current pixel with a corresponding z-value of a z-buffer. To determine each pixel of the triangle is visible (Column 7, lines 6-32; and column 16, lines 48-54).

Regarding claim 10, Regan discloses (Figs. 3 and 11B) a control unit (Fig. 1) that issues a command (Fig. 3, step 130, a re-order triangle vertices command) that specifies the top, middle, and bottom vertices of the triangle as shown in Fig. 11B.

Regarding claim 11, Regan discloses (Figs. 1-3) a vertex buffer (the triangle buffer logic 20), a bounding box generator (Fig. 3, step 140); and a rasterizer (Fig. 1, rasterization 30).

Regarding claim 12, Regan further discloses a set of linear equations (equations (1) and (6) – (8)) that uses the vertices of the triangle (x_0, y_0, z_0) , (x_1, y_1, z_1) and (x_2, y_2, z_2) (Column 29, lines 8-36). This reads on the "edge coefficient generator".

Deering also discloses (Fig. 13B, step 217C) computing linear equation parameters for each edge of the triangle (step 217C).

Regan further teaches one or more attributes associated with the triangle (Column 22, lines 1-6). This reads on the "attribute coefficient generator".

Regan discloses (Figs. 1-3) a vertex buffer (the triangle buffer logic 20), a bounding box generator (Fig. 3, step 140); and a rasterizer (Fig. 1, rasterization 30) to render the pixels that fall within the triangular area (Figs. 13-14, column 33, lines 43-56) (See also column 6, lines 44-61; and column 24, lines 53-57).

Regarding claim 14, Regan discloses (Fig. 29) a chip (1001).

Regarding claims 15 and 29, Regan discloses (Fig. 29) a triangle cache memory (994). Furthermore, the cache memory has a block size is conventional in the art.

Regarding claim 28, Regan discloses (Fig. 16) the determination of the bounding box area with the opposite corners (Right start and Left start) of the rectangular area.

Claim Rejections - 35 USC § 103

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Regan in view of Deering US 2003/0122815) as applied to claim 1 above, and further in view of Van Hook et al (6,549,210).

Regarding claim 13, Regan fails to disclose a wireless communication device.

However, Van Hook et al disclose (Figs. 10A-10B) communication interface (1020) could also be a wireless interface (Column 12, line 60). It would have been obvious to the person of ordinary skill in the art to use the wireless communication interface into the computer graphics display system of Regan to provide a wireless communication interface. Furthermore, communication device such as wireless portable computer is well known to have a wireless communication interface.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deering (US 2003/0122815) in view of Deering (US 2004/0100466).

Regarding claim 16, Deering ('815) discloses (Figs. 1-3) a communication device comprising:

- a display (84A);

- a processor (Fig. 2, CPU 102) to generate video output data presentation by the display as a graphical environment (Fig. 3A); and

- a rendering engine (Fig. 7, draw/render process 352) that applies a direct evaluation algorithm to render a triangle for the graphical environment, wherein the direct evaluation algorithm applies linear equations to render the triangle (Figs. 13B, step 217C and Fig.13E) (See sections 161 and 162).

Deering ('815) fails to teach the limitation "without interpolating between edges of the triangle".

However, since Deering ('815) does not teach any interpolation between edges of the triangle, Deering ('815) meets the negative limitation of the claim. Furthermore, a negative limitation excluded what the inventor did not invent rather than distinctly and particularly pointing out what inventor did invent. In re Schechter, 205 F. 2d 185, 98 USPQ 144 (CCPA 1953).

Regarding to the preamble "A mobile communication device", the Applicant should note that the preamble is for intended use.

Furthermore, another Deering ('466) reference teaches (Fig. 1) a computer system (80) that includes a three-dimensional (3-D) graphics system. The 3-D graphics system comprises personal digital assistants (PDAs) (Section 58).

Therefore, it would have been obvious to the person in the art to use the personal digital assistant of Deering ('466) into the graphics system of Deering ('815) since it is well known in the art that a PDA is a mobile communication device. Furthermore, mobile communication device such as wireless portable computer is well known to have a wireless communication interface.

Regarding claim 17, Deering ('466) also discloses (Fig. 6) the vertices for the triangle (Section 103, lines 10-12).

Allowable Subject Matter

Claims 4, 8, 21 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-Chen et al (US 2003/0212677) disclose (Fig. 2B) a minimum boundary rectangle that bounds the polygon.

-Lavelle et al (US 2003/0142104) disclose a graphics system configured to apply multiple layers of texture information to batches of primitives.

-Tuomi et al (US 2003/0095134) discloses a method for anti-aliasing for video applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LUU MATTHEW whose telephone number is (571) 272-7663. The examiner can normally be reached on Flexible Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, BELLA MATTHEW can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



MATTHEW LUU
PRIMARY EXAMINER